

PRC Environmental Management, Inc.  
233 North Michigan Avenue  
Suite 1621  
Chicago, IL 60601  
312-856-8700  
Fax 312-938-0118

D 3  
8/31/93



**PRC**

**SITE EVALUATION ACCOMPLISHED REPORT**

**CARSTAB CORPORATION  
READING, OHIO**

**U.S. EPA ID NO. OHD000724138**

**Prepared for**

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
Site Assessment Section  
77 West Jackson Boulevard  
Chicago, IL 60604**

EPA Work Assignment No.	:	31-5JZZ
EPA Region	:	5
Date Prepared	:	August 31, 1993
Contract No.	:	68-W8-0084
PRC No.	:	030-00314603
Prepared by	:	PRC Environmental Management, Inc. (Alicia Shultz) (215) 972-0421
Contractor Project Manager	:	Eric Morton
Telephone No.	:	(312) 856-8797
EPA Work Assignment Manager	:	Jeanne Griffin
Telephone No.	:	(312) 886-3007

**CONFIDENTIAL DRAFT**

-4059-

## TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
1.0	INTRODUCTION . . . . .	1
2.0	SITE DESCRIPTION . . . . .	1
3.0	SITE OPERATIONS AND HISTORY . . . . .	4
4.0	MIGRATION AND EXPOSURE PATHWAYS . . . . .	9
4.1	GROUNDWATER MIGRATION PATHWAY . . . . .	9
	4.1.1 Geology and Soils . . . . .	9
	4.1.2 Groundwater Releases . . . . .	11
	4.1.3 Targets . . . . .	11
4.2	SURFACE-WATER MIGRATION PATHWAY . . . . .	16
	4.2.1 Migration Route . . . . .	16
	4.2.2 Surface-Water Release . . . . .	16
	4.2.3 Targets . . . . .	16
4.3	SOIL EXPOSURE PATHWAY . . . . .	17
4.4	AIR MIGRATION PATHWAY . . . . .	17

## FIGURES

<u>Figure</u>		<u>Page</u>
1	SITE LOCATION . . . . .	2
2	SITE VICINITY MAP . . . . .	3
3	SITE FEATURES . . . . .	5
4	GENERALIZED COLUMN FOR SITE VICINITY . . . . .	10

## TABLES

<u>Table</u>		<u>Page</u>
1	OBSERVED RELEASE SAMPLES - SOURCE 1 . . . . .	12
2	OBSERVED RELEASE SAMPLES - SOURCE 2 . . . . .	13

CONFIDENTIAL DRAFT

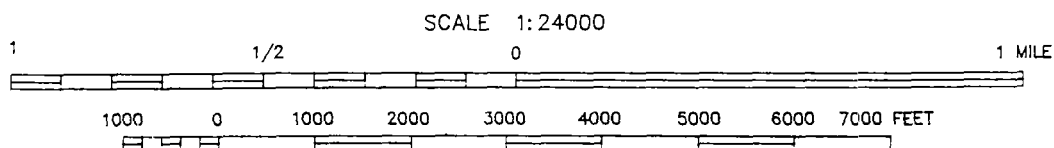
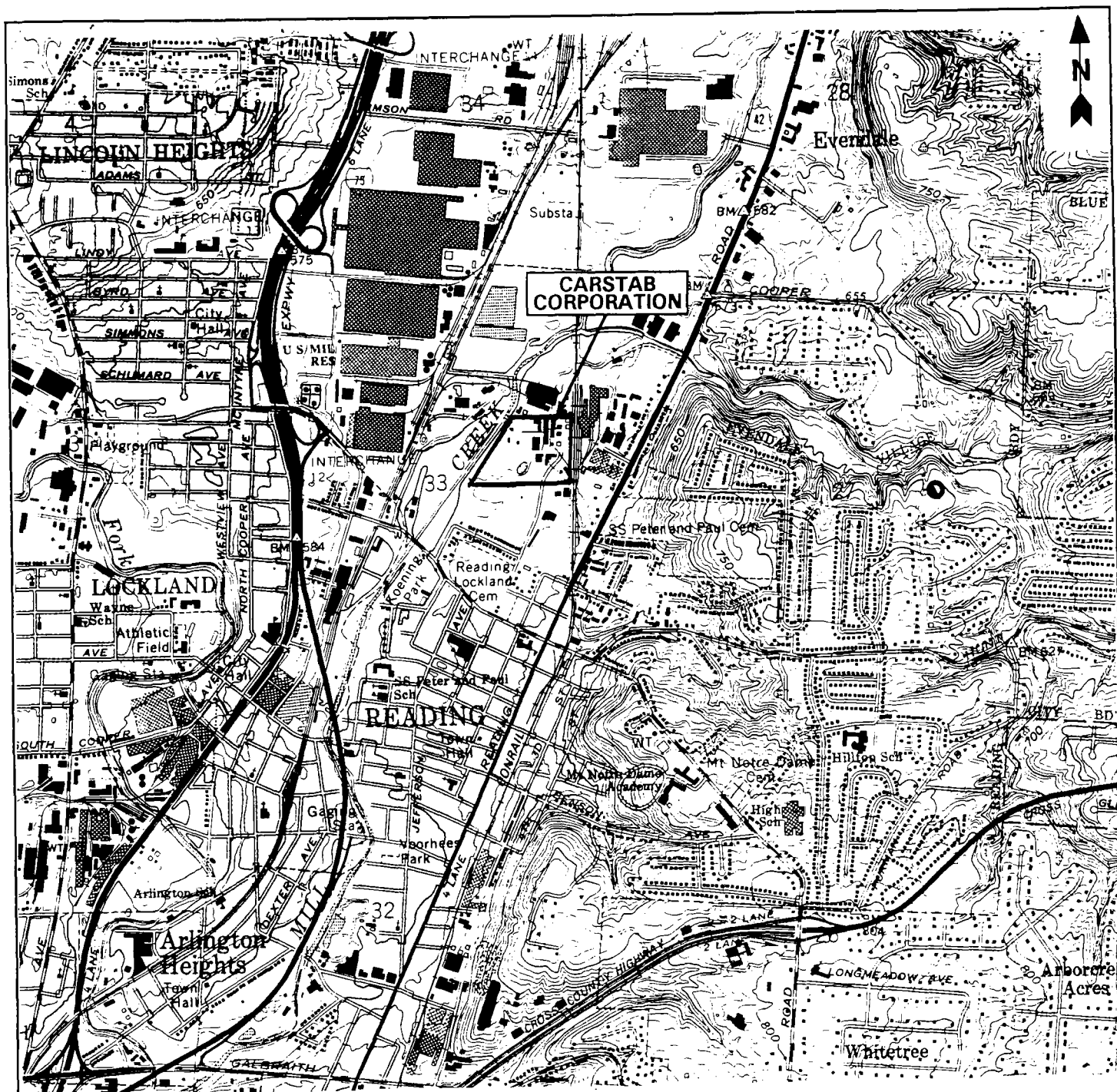
## **1.0 INTRODUCTION**

Under Contract No. 68-W8-0084, Work Assignment No. 31-5JZZ, PRC Environmental Management, Inc. (PRC), has evaluated the Carstab Corporation site in Reading, Hamilton County, Ohio, as a potential candidate for the National Priorities List (NPL) and has prepared this draft site evaluation accomplished report. Using the Hazard Ranking System (HRS), PRC evaluated the site to determine whether, or if so, to what extent, it poses a threat to human health and the environment. This report presents the results of PRC's evaluation and summarizes the site conditions and targets pertinent to the migration and exposure pathways associated with the Carstab Corporation site. Information was obtained from the expanded site inspection report, U.S. Environmental Protection Agency (EPA) files, and the Ohio Environmental Protection Agency (OEPA). Based on the information available, the Carstab Corporation site will not receive an HRS score of 28.50 or greater. The score reflects an anticipated reduction of targets that will occur when municipal well fields within the target distance limit are closed.

This report has six sections, including this introductory section. Section 2.0 describes the site. Section 3.0 the history of the site and its operations. Section 4.0 provides information about the four migration and exposure pathways (groundwater migration, surface-water migration, soil exposure, and air migration) that can be scored.

## **2.0 SITE DESCRIPTION**

The Carstab Corporation (Carstab) site is an active chemical manufacturing facility located at 2000 West Street in the city of Reading, Hamilton County, Ohio (Figures 1 and 2). The site began operating in 1949 and currently is owned and operated by Morton International, Inc. (Morton). Carstab was known as Cincinnati Milacron Corporation before 1980. The latitude and longitude of the site are 39°14'3.02" north and 89°25'19.3" west, respectively (PRC, 1993a). Carstab manufactures heat stabilizers and lubricants for rigid polyvinyl chloride. The facility also manufactures additives, surfactants, and antioxidants for asphalt compounds (Ecology and Environment, Inc. [E&E], 1991a; PRC, 1993a).



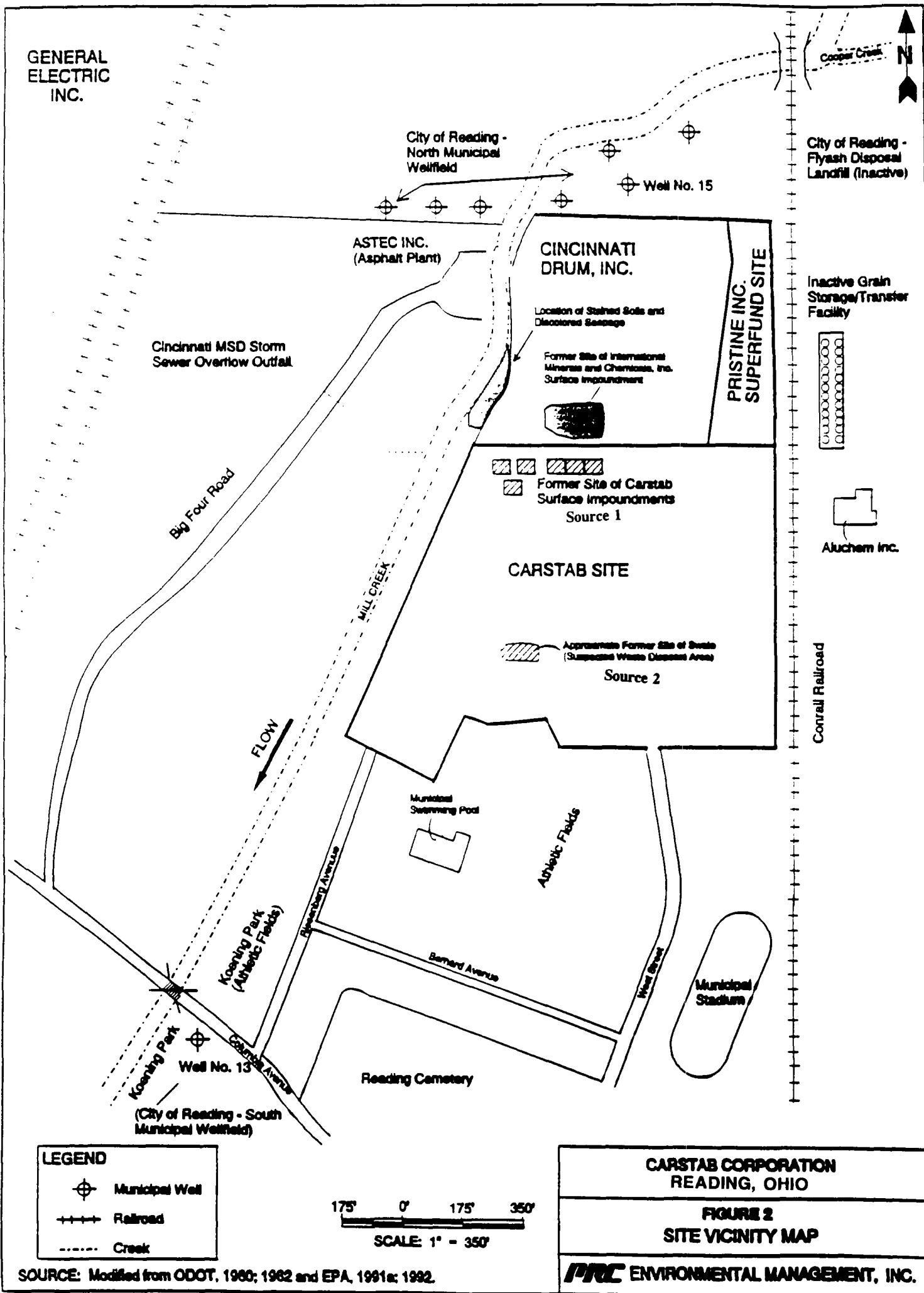
QUADRANGLE LOCATION

SOURCE: Modified from USGS, 1961a; 1965.

CARSTAB CORPORATION  
READING, OHIO

FIGURE 1  
SITE LOCATION MAP

**PRC** ENVIRONMENTAL MANAGEMENT, INC.



The area of operations at the site covers approximately 34 acres (Figures 2 and 3). A fenced area of 27 acres houses production operations. Several public baseball fields, maintained by the city of Reading, are located outside the fence at the southern boundary of the site on 7 acres of land also owned by Morton (PRC, 1993a). That property is not part of the site. Carstab is bounded by the East Fork of Mill Creek on the west; a city park, public pool, and athletic stadium on the south; and the Conrail railroad tracks on the east (PRC, 1993a; U.S. Geological Survey [USGS], 1961). The Pristine, Inc. site, a former hazardous waste incinerator and disposal facility that is listed on the NPL, is adjacent to the northeast portion of the Carstab site (PRC, 1993a). Groundwater contaminated with volatile organic compounds (VOC), pesticides, and metals has been documented at the Pristine, Inc. site (EPA, 1987). Cincinnati Drum Service Corporation, an active drum recycling facility, is located north of Carstab and west of Pristine (PRC, 1993a).

Numerous other industrial facilities are located in the area. General Electric, Inc. and an asphalt plant are located west of Carstab, across Mill Creek. Aluchem, Inc., a company that performs process grinding of aluminum silicates (PRC, 1992a), and an inactive grain elevator and transfer facility are located to the east of the Conrail railroad tracks (PRC, 1993a).

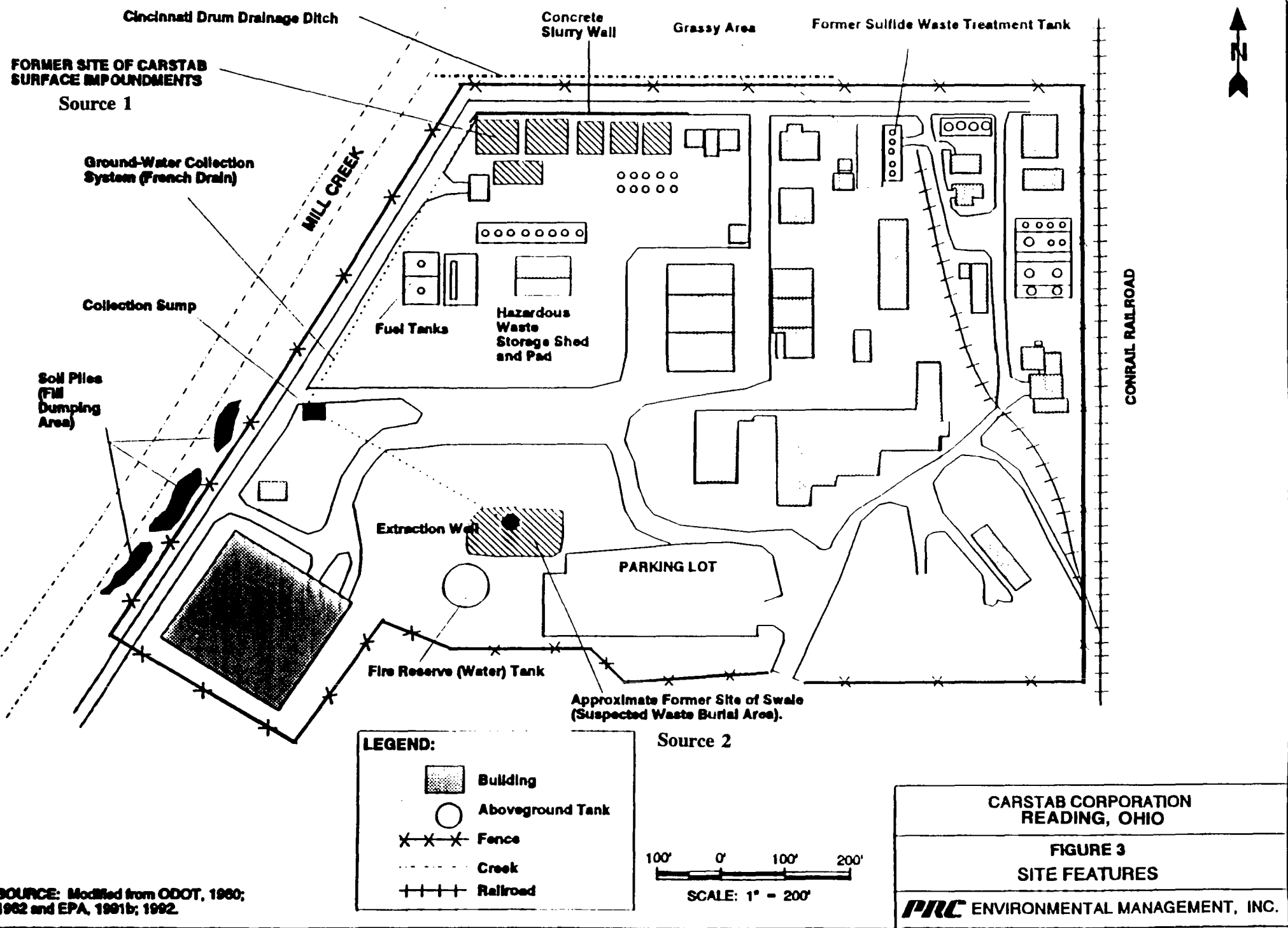
Two sources of contamination located on the Carstab site were evaluated with the HRS. Source 1 consists of six earthen surface impoundments (specifically, three acid neutralization impoundments, two settling impoundments, and one clean-water impoundment) each six-feet deep, that have been filled and covered. Source 2 consists of a topographic depression or drainage swale that reportedly was used for the disposal of lime sludge (PRC, 1993a). Other potential sources of contamination located at the site include a closed aboveground sulfide tank, two wastewater storage tanks, product storage tanks, and a hazardous waste storage area. However, those sources were not evaluated because inspections indicate that the sources are contained (have a containment value of zero). In addition, there is no indication of a spill or release from those sources.

### **3.0 SITE OPERATIONS AND HISTORY**

The western and southern portions of the Carstab site once were part of a large dairy farm. A winery and a smokehouse were located in the northeast portion of the site. The site was purchased and

5

CONFIDENTIAL DRAFT



developed by the Cincinnati Milling Machine Company (subsequently known as Cincinnati Milacron Corporation [Cincinnati Milacron]) in 1949 (PRC, 1992a). Cincinnati Milacron constructed the chemical manufacturing facilities at the site and operated the plant until 1980, when it was purchased by Carstab (a division of Thiokol, Inc.). Thiokol, Inc. merged with Morton in 1982. The two companies separated in 1989; Morton's Industrial Chemicals Division retained ownership of the Carstab site (PRC, 1993a).

From 1950 until 1979, Source 1 was used to treat hydrochloric and sulfuric acid wastes (PRC, 1993a). Aerial photographs indicate that the area of Source 1 was approximately 21,200 square feet (PRC, 1993a). The wastes discharged to Source 1 contained hydrochloric and sulfuric acid, heavy metals, and organic compounds (OEPA, 1986; PRC, 1993a). Source 1 was backfilled and covered in 1979 (PRC, 1993a). According to the Notification of Hazardous Waste Site for the Carstab site, Source 1 was dredged of sludge before being filled (EPA, 1981). The quantity of sludge dredged from Source 1 and the location at which it was disposed of are not known (E&E, 1991a). In 1981 and 1990, borehole soil samples were obtained from the area of the impoundments at depths ranging from 5 to 17 feet below ground surface (bgs). The soil samples revealed bis(2-chloroethyl)ether; 1,2-dichlorobenzene; 1,3-dichlorobenzene; 1,4-dichlorobenzene; and toluene (E&E, 1991a; E&E, 1982). Groundwater samples obtained in 1992 at a location topographically downgradient of the impoundments revealed acetone; toluene; chlorobenzene; ethylbenzene; xylene; 1,2-dichlorobenzene; and 1,4-dichlorobenzene (PRC, 1993a).

Source 2 was used during the 1950s for disposal of lime sludge (PRC, 1992a), steel and fiber drums, and drums for chemicals (E&E, 1991a; E&E, 1991b). The source of the sludge and drums is not documented. In 1980, metal detectors were used to determine the location of the drums; however, no drums were located (E&E, 1982). In 1992, groundwater samples were obtained at a location topographically downgradient of Source 2. The samples revealed acetone; chlorobenzene; and 1,2-dichlorobenzene. Source 2 currently is covered with soil and vegetation (PRC, 1993a).

In 1969, an explosion and fire, caused by a process that used sodium, occurred inside one of the buildings at the Carstab site. Additionally, sometime before 1978, employees at the Carstab site were exposed to dimethyltin dichloride during a release inside one of the buildings (E&E, 1991a).



Before 1983, Carstab used several aboveground tanks, located in the northeast portion of the site, for treatment and storage of sulfide wastewater. Carstab therefore filed a Resource Conservation and Recovery Act (RCRA) Part A permit application as a treatment, storage, and disposal facility in November 1980 and obtained interim status. In 1983, Carstab withdrew its RCRA Part A permit application, reverting to generator-only status, as the tanks are no longer used for the treatment or storage of hazardous waste. The facility stores all hazardous wastes for 90 days or less in the designated hazardous waste storage area (OEPA, 1992; PRC, 1993a).

Several RCRA interim status inspections have been conducted at Carstab. Carstab was found to be in compliance, with the exceptions of improper aisle space in the drum storage area and lack of documented daily inspections of storage tanks (OEPA, 1982a).

Hazardous waste investigations began at Carstab in 1979, when a leachate seep was observed along the east bank of Mill Creek. The potential sources of the leachate were identified as Pristine, Inc.: Cincinnati Drum, Inc. (Cincinnati Drum); and Carstab. OEPA obtained several samples of the leachate. Analysis of the samples revealed the presence of toluene, xylene, chlorobenzene, dichlorobenzene, phenol, lead, and chromium (OEPA, 1983). Because OEPA believed Carstab to be the sources of the leachate, OEPA requested in 1980 that Carstab determine the extent of contamination at the Carstab site. OEPA subsequently issued findings and orders to Carstab, pursuant to Section 6111.03 (H) of the Ohio Revised Code. The findings stated that hydrogeological studies performed by OEPA concluded that wastes were entering the groundwater from sources of potential contamination at Carstab and that the wastes were migrating through a lens of sand and gravel and were appearing as leachate where the lens outcrops on the stream bank of Mill Creek. Constituents of the waste included aniline; toluene; chlorobenzene; and 1,2-dichlorobenzene, as well as arsenic, chromium, and lead compounds. Carstab was ordered to determine the extent to which wastes from its property were migrating off site and to recommend remedial measures to prevent off-site migration to Mill Creek and to groundwater (OEPA, 1982b).

In response to the actions described above, Carstab installed a groundwater collection system to collect contaminated groundwater before it would migrate off site. The system included a french drain installed along the western boundary of the site and a four-inch diameter extraction well and submersible pump (PRC, 1993a; E&E, 1991b). The extraction well was installed in the area of

Source 2. Because the french drain would create a hydraulic sink and possibly draw groundwater from the Cincinnati Drum and Pristine facilities, Carstab installed a concrete wall along the northern boundary of the site, directly north of the surface impoundments (see Figure 3). The purpose of the wall is to intercept groundwater from Cincinnati Drum. The groundwater from the french drain and the extraction well is collected in a sump. From the sump, the groundwater is pumped to a water treatment facility and treated with hydrogen peroxide. The treated effluent is discharged to the Cincinnati Metropolitan Sewer District system through a permitted discharge (PRC, 1993a).

In 1991, EPA directed the Technical Assistance Team (TAT) to conduct a site assessment of the Carstab site because a white crystalline substance was observed along the east bank of Mill Creek adjacent to the Carstab site. During TAT's assessment the crystalline substance was not observed. Soil samples were obtained from the baseball field south of Carstab and surface-water sediment samples from Mill Creek. The analysis did not reveal the presence of any hazardous substance at levels significantly above background levels (E&E, 1991b).

In 1992, EPA conducted an expanded site inspection of the Carstab site. Monitoring wells were installed, and groundwater, soil, and sediment samples were obtained. Several piles of soil located along the western boundary of the Carstab site also were sampled. The source of the soil was not identified. Analysis of the soil samples did not reveal the presence of any hazardous substances at concentrations significantly above background concentrations (PRC, 1993a).

Currently, Carstab has 70 aboveground storage tanks, with capacities ranging from 1,000 to 48,000 gallons. The tanks contain raw materials used in manufacturing processes, including: propane; asphalt additives; feedstocks; paving bonding additives; stannic chloride; and methyl chloride solution. The tanks also store the finished products (E&E, 1991a). Carstab also has a hazardous waste storage area, located in the north-central portion of the site. The area consists of a concrete pad and enclosed metal shed. The concrete pad is surrounded by a drain and sump to prevent migration of spills. During the 1992 expanded site inspection, no evidence of leaks or spills was observed in the hazardous waste storage area or in the area occupied by the aboveground tanks (PRC, 1993a). Each year, Carstab generates approximately 150,000 to 170,000 pounds of various types of hazardous waste that are taken off site for disposal within 90 days (E&E, 1991a).

## **4.0 MIGRATION AND EXPOSURE**

This section describes the migration and exposure pathways associated with the Carstab Corporation site. Section 4.1 discusses the groundwater migration pathway; Section 4.2 discusses the surface-water migration pathway; Section 4.3 discusses the soil exposure pathway; and Section 4.4 discusses the air migration pathway.

### **4.1 Groundwater Migration Pathway**

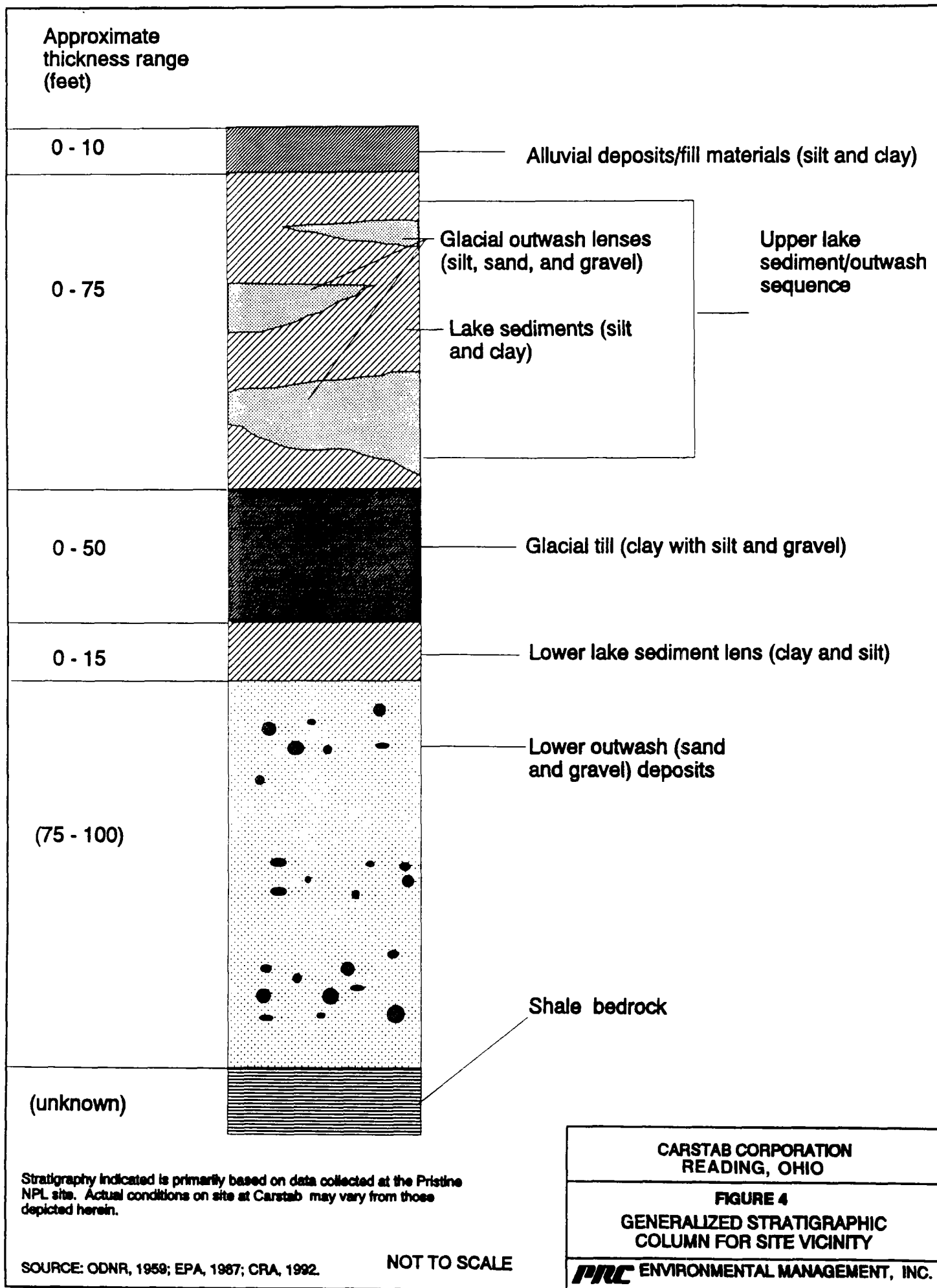
This section discusses geology and soils, groundwater releases, and targets associated with the groundwater pathway at the site.

#### **4.1.1 Geology and Soils**

The Carstab site is underlain by unconsolidated valley fill sediments, 150 to 180 feet in depth, that overlie bedrock. Valley fill materials consists of a thin layer of recent alluvial material overlying glacial deposits (outwash and lacustrine deposits). Glacial deposits consist of interbedded outwash (silt, sand, and gravel), till (clay and silts), and lake deposits (fine-grained clays and silts) that are discontinuous and often lenticular in form (PRC, 1993a; Figure 4). There are three outwash lenses in the vicinity of the site (EPA, 1987).

The upper water-bearing zone consists predominantly of discontinuous outwash lenses, interbedded with lake sediments. This zone overlies a discontinuous layer of Wisconsinan glacial till and, at some locations, another layer of lake sediments. In the vicinity of the site, the lake deposits and glacial till are absent (EPA, 1987).

The lower water-bearing zone consists of relatively thick outwash layers, with occasional discontinuous clay and silt layers (PRC, 1993a). This zone is approximately 80 feet thick. As the principal regional water-supply formation, the lower water-bearing zone supplies approximately five million gallons per day for drinking water to several municipalities in the area, as well as water for industrial processes (EPA, 1987).



The upper and lower water-bearing zones are hydraulically connected, as evidenced by the discontinuous nature of the outwash layers and the presence in the lower zone of contamination from the Pristine, Inc. site, which is adjacent to the Carstab site (PRC, 1993a; EPA, 1987).

#### **4.1.2 Groundwater Releases**

A release from Source 1 and Source 2 to groundwater can be documented by chemical analysis. During the 1992 expanded site inspection, groundwater samples were obtained from background monitoring wells and from monitoring wells located topographically downgradient of Source 1 and Source 2. Sampling and analysis procedures, time of sampling, and sampling depths were comparable for all the samples. Tables 1 and 2 provide a summary of the samples indicating observed release from, Sources 1 and 2, respectively. In cases in which analytical results were qualified because of quality assurance or quality control (QA/QC) problems, the results were evaluated to determine whether the QA/QC problem resulted in a high, low, or unknown bias in the data. EPA protocols require that only those results for which the analytical bias has not affected the usability of the result be considered for HRS scoring. The observed releases from Sources 1 and 2 at the Carstab site were documented in accordance with those protocols. The hazardous substances detected in the samples indicating an observed release include acetone; toluene; chlorobenzene; ethylbenzene; xylene (total); 1,2-dichlorobenzene; and 1,4-dichlorobenzene (PRC, 1993a).

#### **4.1.3 Targets**

Located within a four-mile radius of Sources 1 and 2 are the municipal drinking-water wells of Reading, Wyoming, Lockdale, and Glendale. The municipal wells draw water from the glacial formation (PRC, 1993a). Therefore, those wells are subject to potential contamination from the Carstab site. The distances to the wells and the formation in which they are completed are provided in the table below.

Areas not served by the municipal wells mentioned above obtain their supplies from Cincinnati Water Works (CWW). CWW does not have any drinking-water wells within a four-mile radius of Sources 1 and 2. No private water-supply wells are located within the four-mile radius (E&E, 1991a).

Table 1

## Background and Release Samples - Source 1

<i>Sample ID</i>	MW-EPA-2	MW-5	MW-EPA-1	
<i>Matrix</i>	Groundwater	Groundwater	Groundwater	
<i>Screened Interval (ft)</i>	11 - 21	6 - 16	7 - 17	
<i>Description</i>	Background Source 1	Release Source 1	Release Source 1	
<i>References</i>	PRC, 1993a; RECRA, 1992	PRC, 1993a; RECRA, 1992	PRC, 1993a; RECRA, 1992	
<i>Date Sampled</i>	09/28/92	09/29/92	09/29/92	
Contaminant	Concentration (ppb)	Concentration (ppb)	Concentration (ppb)	Det. Limit <sup>a</sup> (ppb)
acetone	ND	19	2700	10
toluene	ND	ND	630	10
chlorobenzene	ND	730D	2300	10
ethylbenzene	ND	ND	110J	10
xylene (total)	ND	ND	360	10
1,4-dichlorobenzene	ND	NA	6405	10
1,2-dichlorobenzene	ND	NA	4700J	10

<sup>a</sup> = Contract Required Quantitation Limit (CRQL)

ppb = Parts per billion

D = Compound identified in an analysis at a secondary dilution factor. The data are quantitative. The CRQL may have changed. The change in CRQL is not available.

J = Indicates an estimated value

ND = Not detected

NA = Not analyzed

**Table 2****Background and Release Samples - Source 2**

<i>Sample ID</i>	MW-EPA-4	MW-P1 (MW2)	
<i>Matrix</i>	Groundwater	Groundwater	
<i>Screened Interval (ft)</i>	16.5 - 21.5	10 - 20	
<i>Description</i>	Background Source 2	Release Source 2	
<i>Reference</i>	PRC, 1993a; RECRA, 1992	PRC, 1993a; RECRA, 1992	
<i>Date Sampled</i>			
Contaminants	Concentration (ppb)	Concentration (ppb)	Det. Limits <sup>a</sup> (ppb)
Acetone	ND	22	10
Toluene	ND	3J	10
Chlorobenzene	2J	150	10
1,2-Dichlorobenzene	ND	11	10

<sup>a</sup> = Contract Required Quantitation Limit  
 ppb = Parts per billion  
 J = Indicates an estimated value  
 ND = Not detected

Well	Distance from source (miles)	Screened Interval (ft)	Formation	Reference
Reading: North Well Field*	0.15	150 - 190	Glacial	EPA, 1987 PRC, 1993a PRC, 1993b
Reading: South Well Field*	.45	150 - 190	Glacial	EPA, 1987 PRC, 1993a PRC, 1993b
Wyoming	1.40	180 - 219	Glacial	EPA, 1987 PRC, 1993a PRC, 1993b
Glendale	2.40	200	Glacial	EPA, 1987 PRC, 1993a PRC, 1993b
Lockdale	3.20	178 - 204	Glacial	EPA, 1987 PRC, 1993a PRC, 1993b

\* Scheduled for closure in 1994 as a result of contamination (from the Pristine, Inc. Site)

The Reading municipal wells are the drinking-water wells nearest to the Carstab site. The wells serve a total population of 12,800 people (PRC, 1992b). Reading's wells are located in two wellfields. The north wellfield is located within a .25-mile radius of Sources 1 and 2; the south wellfield is located within a .5-mile radius of Sources 1 and 2. Past testing of the Reading wells has indicated the presence of VOCs, primarily 1,2-dichloroethane, at concentrations exceeding the maximum contaminant level (MCL) established by the Safe Drinking Water Act of 1987. In 1987, the OEPA ordered Reading to close several wells, including their highest capacity well (Well No. 15) because of that contamination. The Reading wells were placed back into service after Reading installed an air-stripping unit. OEPA issued Reading a five-year permit, which has expired, to use the wells and air-stripping unit, with the contingency that Reading would locate a suitable alternative location for a wellfield or convert to water from an outside supplier (PRC, 1993a).

Findings and orders for the city of Reading wellfield were issued on February 16, 1993. The orders allow Reading 90 days to submit a plan for an alternative source of its water supply. The plan was approved by OEPA in June 1993 and Reading will be given nine months to implement the plan (PRC,



1993c). The Reading wells will be operational at least until the end of 1993 (OEPA, 1993). Because the wells are scheduled to be closed in 1994, the population served by those wells was not evaluated (EPA, 1993). The 1,2-dichloroethane contamination in the wells has been attributed to Pristine, Inc. (PRC, 1993a). The Reading wells were sampled in 1992 during the expanded site inspection. However, no hazardous substances attributable to Sources 1 or 2 were detected in the samples. Therefore, the contaminants detected in the wells were not attributed to Carstab (PRC, 1993a).

Provided in the table below are the populations served by drinking-water wells within a four-mile radius of Sources 1 and 2 and the distance-weighted population value (EPA, 1990).

#### Population Served by Drinking Water Wells

Distance Category (Miles)	Municipality	Number of Wells	Population Served	Distance-Weighted Population Value	Reference
0 - 1/4	Reading*	--	--	--	--
1/4 - 1/2	Reading*	--	--	--	--
1/2 - 1	None	--	--	--	--
1 - 2	Wyoming	6	3,001 - 10,000	939	E&E, 1991a PRC, 1992c
2 - 3	Glendale	2	2,500		E&E, 1991a PRC, 1992c
	Lockdale	3	4,300		PRC, 1993a
			6,800	678	PRC, 1993b PRC, 1993c
3 - 4	None	--	--	--	--

**Total                      1,617**

\* Scheduled for closure in 1994 as a result of contamination (from the Pristine, Inc. Site).

**Sum of Distance-Weighted Population Value: 1,617**

## **4.2 Surface-Water Migration Pathway**

This section discusses the migration route, surface-water releases, and targets associated with the surface-water pathway migration at the Carstab site.

### **4.2.1 Migration Route**

All surface-water runoff from Carstab flows to Mill Creek, located along the western boundary of the site. Mill Creek's flow is within the range of 10 to 100 cubic feet per second (cfs). Mill Creek flows approximately 12 miles downstream to its confluence with the Ohio River, which has an average annual flow of 10,000 to 100,000 cfs. The sources located on Carstab are not located within a 100-year flood plain. Although leachate has been observed to enter Mill Creek, the exact source of the leachate has not been determined. Many of the hazardous substances detected in the leachate also were found in samples obtained from Cincinnati Drum, Inc. and Pristine, Inc. (PRC, 1993a).

### **4.2.2 Surface-Water Release**

An observed release to Mill Creek by direct observation from the Carstab site was assumed for purposes of being conservative in terms of protection for human health and the environment (leachate entering Mill Creek). The exact source of the leachate has not been determined. Sediment samples obtained downstream of Carstab did not reveal any hazardous substances in concentrations above the background levels (PRC, 1993a).

### **4.2.3 Targets**

Neither Mill Creek nor the Ohio River is used for drinking-water supplies or agricultural uses within the 15-mile downstream target distance limit. It is not documented that fish are taken from Mill Creek for human consumption. The creek flows through heavy industrial areas and has been polluted by discharge of sewage (OEPA, 1983; PRC, 1993a). Much of the downstream portion of Mill Creek has been diverted through a concrete channel and is very shallow. Therefore, Mill Creek is not suitable for sustaining significant fish populations. Fishing for human consumption does occur in the Ohio River. However, the average discharge of the Ohio River is relatively high (in the range of approximately 10,000 to 100,000 cfs), a circumstance resulting in a significant dilution factor. No

wetlands or other sensitive environments have been identified within 15 miles downstream from the Carstab site. Mill Creek does flow near several residential areas, however, and children occasionally play in and around the creek (PRC, 1993a).

#### **4.3            Soil Exposure Pathway**

The soil exposure pathway was not evaluated because analytical data available at the time this report was prepared were insufficient to score the pathway. All potential sources of surface soil contamination currently are covered with asphalt or with vegetated soil (PRC, 1993a).

#### **4.4            Air Migration Pathway**

The air migration pathway was not evaluated because analytical data available at the time this report was prepared were insufficient to score the pathway. In addition, all sources of potential contamination of the air are covered with asphalt or with vegetated soil (PRC, 1993a).

## REFERENCES

- Ecology and Environment, Inc. (E&E). 1991a. Screening Site Inspection Report for Carstab Corporation, Reading, Ohio, TDD: F05-9008-013.
- E&E. 1991b. Site Assessment Report for Carstab Corporation Site, Reading, Hamilton County, Ohio. August 9.
- E&E. 1982. Hydrogeologic Report of the Pristine - Cincinnati Drum - Carstab Site in Reading, Ohio. November.
- Ohio Environmental Protection Agency (OEPA). 1993. Letter Regarding Consent Order. From Amy Gibbons, Division of Emergency and Remedial Response. To Jeanne Griffin, EPA. April 20.
- OEPA. 1992. Letter Regarding RCRA Status of the Carstab Site. From Amy Gibbons. To Guy Montford, PRC. March 2.
- OEPA. 1986. Potential Waste Site Preliminary Assessment. Prepared by Scott Shane, OEPA. June.
- OEPA. 1983. Interoffice Communication Regarding Investigations at the Carstab Corporation. Between Ed Kitchen, Division of Hazardous Materials Management and Ben Pfefferlen, Legal. May 2.
- OEPA. 1982a. Letter Regarding the February 22, 1982 Inspection at the Carstab Facility. From Randall Marshall. To Raymond Phillips, Materials Manager of Carstab Corporation. March 9.
- OEPA. 1982b. Letter Regarding Final Findings and Orders. From James F. Flautt, Supervisor, Permit Data Management Unit, Division of Hazardous Materials Management. To Raymond Phillips, Materials Manager, Carstab Corporation. December 2.
- PRC. 1993a. Expanded Site Inspection Report, Carstab Corporation (Morton International, Inc.) Site, Cincinnati, Ohio, EPA ID# OHD000724138. March 10.
- PRC. 1993b. Record of Telephone Conversation Regarding Drinking-Water Wells. Between Alicia Shultz, PRC, and Patsy Hall, OEPA, Drinking Water. June 4.
- PRC. 1993c. Record of Telephone Conversation Regarding Drinking Water. Between Guy Montford, PRC, and Lonny McKenney, Village of Lockdale, Ohio, Water Plant Supervisor. March 31.
- PRC. 1992a. Logbook for the Carstab site. Expanded site inspection. March 10.
- PRC. 1992b. Record of Telephone Conversation Regarding Drinking Water. Between Laurel Berman, PRC, and Guy Montford, PRC. June 2.
- PRC. 1992c. Record of Telephone Conversation Regarding Drinking Water. Between Guy Montford, PRC, and John Wirtz, Wyoming Water Department. March 31.

- RECRA ENVIRON (RECRA). 1992. Analytical data sheets from the Expanded Site Inspection conducted by PRC.
- U.S. Environmental Protection Agency (EPA). 1993. Memorandum Regarding the Hazard Ranking System (HRS) Package for the Carstab Corporation Site. From Jeanne Griffin, Ohio Site Assessment Manager. To Eric Morton, Project Manager, PRC. July 20.
- EPA. 1990. Hazard Ranking System (HRS) Final Rule. 55 Federal Register 51532. December 14.
- EPA. 1987. Addendum to the Investigative Report for the Pristine Inc. site, Reading, Ohio. Prepared by Roy F. Weston, Inc., under contract to Camp, Dresser, and McKee, Inc., Chicago.
- EPA. 1981. Notification of Hazardous Waste Site for Carstab Corporation. Prepared by Joseph A. Mazzei, Vice President, Carstab Corporation. June 1.
- U.S. Geological Survey (USGS). 7.5-Minute Series Topographic Maps: Cincinnati East, Ohio Quadrangle, 1961 (photo revised [PR] 1981); Madeira, Ohio Quadrangle, 1961 (PR 1988); Glendale, Ohio Quadrangle, 1965 (PR 1987); and Greenhills, Ohio Quadrangle, 1965 (PR 1981).